Litton BIONETICS

Mutagenic Evaluation of Compound FDA 71-21 (Potassium Metabisulfite) 4/30/75

MUTAGENIC EVALUATION OF

COMPOUND 004429429

POTASSIUM METABISULFITE

(71-21)

LBI PROJECT # 2468

MUTAGENIC EVALUATION OF

COMPOUND 004429429

POTASSIUM METABISULFITE

(71-21)

SUBMITTED TO

FOOD & DRUG ADMINISTRATION
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
ROCKVILLE, MARYLAND

SUBMITTED BY

LITTON BIONETICS, INC.
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KENSINGTON, MARYLAND

APRIL 30, 1975

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EVALUATION SUMMARY

Compound 004429429, Potassium Metabisulfite, did not exhibit genetic activity in any of the assays employed in this evaluation.

DATE: April 30, 1975

SPONSOR: Food and Drug Administration, Contract Number 223-74-2104

SUBJECT: Evaluation of Test Compound 004429429, Potassium Metabisulfite

I. OBJECTIVE

The objective of this study was to evaluate the test compound for genetic activity in microbial assays with and without the addition of mammalian metabolic activation preparations.

II. MATERIALS

A. Test Compound

1. Date Received: August, 1974

2. Description: White powder

B. Indicator Microorganisms

The following strains of indicator microorganisms were used in the evaluation:

Yeast Strain: *Saccharomyces cerevisiae*, strain D4

Bacteria Strains: *Salmonella typhimurium*, strains: TA-1535
TA-1537
TA-1538

C. Reaction Mixture

The following reaction mixture was employed in the activation tests:

Component	Final Concentration/ml
1. TPN (sodium salt)	6 μ M
2. Isocitric acid	49 μ M
3. Tris buffer, pH 7.4	28 μ M
4. $MgCl_2$	1.7 μ M
5. Tissue homogenate fraction	72 mg

D. Tissue Homogenates and Supernatant

The tissue homogenates and 9,000 x g supernatants were prepared from tissues of the following mammalian species: Mouse-ICR random bred adult males; rat-Sprague-Dawley adult males; and primate-Macaca mulatta adult males.

E. Positive Control Compounds

Table 1 lists chemicals for positive controls in the direct and activation assays.

TABLE 1

POSITIVE CONTROLS USED IN DIRECT AND ACTIVATION ASSAYS

Assay	Chemical[a]	Solvent	Probable Mutagenic Specificity
Non-activation	Ethyl methanesulfonate	Water or saline	BPS
	2-Nitrofluorene	Dimethylsulfoxide[c]	FS
	Quinacrine mustard	Water or saline	FS
Activation	Dimethylnitrosamine	Water or saline	BPS
	2-Acetylaminofluorene	Dimethylsulfoxide[c]	FS

[a] Concentrations given in the Results Section
[b] BPS = base-pair substitution; FS = frameshift
[c] Previously shown to be non-mutagenic

III. METHODS

A. Toxicity

The solubility, toxicity and doses for all chemicals were determined prior to screening.

Each chemical was tested for survival against the specific indicator strains over a range of doses to determine the 50% survival dose. Bacteria were tested in phosphate buffer, pH 7.4, for one hour at 37°C on a shaker. Yeasts were tested in phosphate buffer, pH 7.4, for four hours at 30°C on a shaker. The 50% survival curve and the 1/4 and 1/2 50% doses calculated.

If no toxicity was obtained for a chemical with a given strain, then a maximum dose of 5% (w/v) was used against the strain.

Unless otherwise specified, the doses calculated for the tests in buffer were applied to the activation tests. The solubility of the test chemical under treatment conditions is stated in the Results Section.

B. Plate Tests

In the nonactivation procedure, approximately 10^9 cells of a log-phase culture of the bacterial indicator strains were spread over the surface of a minimal plate, and a measured amount of the test chemical was placed in the center of the test plate. In activation tests, the test chemical was added to the cells, and an aliquot of the mixture was spread on the surface of the test plate. The reaction mixture (0.1 ml) plus tissue extract was then spotted on the surface of the plate. Positive and solvent controls were included. All plates were incubated at 37°C for four days and then scored. Each compound (test, positive control and solvent control) was done in duplicate. Concentrations of the positive control compounds are listed in the Results Section.

C. Suspension Tests

1. Non activation

Log-phase bacteria and stationary-phase yeast cultures of the indicator organisms were grown in complete broth, washed and resuspended in 0.9% saline to densities of 1×10^9 cells/ml and 5×10^7 cells/ml, respectively. This constituted the working stock for tests of a group of test chemicals and their respective controls. Tests were conducted in plastic tissue culture plates. Cells plus appropriate volume(s) of the test chemical were added to the wells to give a final volume of 1.5 ml. The solvent replaced the test chemical in the negative controls. Treatment was at 30°C for four hours for yeast tests and at 37°C for one hour for bacterial tests. All flasks were shaken during treatment. Following treatment, the plates were set on ice. Aliquots of cells were removed, diluted in sterile saline (4°C) and plated on the appropriate complete media. Undiluted samples from flasks containing the bacteria were plated on minimal selective medium in reversion experiments. Samples from a 10^{-1} dilution of treated cells were plated on the selected media for enumeration of gene conversion with strain D4. Bacterial plates were scored after incubation for 48 hours at 37°C. The yeast plates were incubated at 30°C for 3-5 days before scoring.

2. Activation

Bacteria and yeast cells were grown and prepared as described in the non activation tests. Measured amounts of the test and control chemicals plus 0.25 ml of the stock-cell suspension were added to wells of the Linbro plate containing the appropriate tissue fraction and reaction mixture. All flasks (bacteria and yeast) were incubated at 37°C in an oxygen atmosphere with shaking. The treatment times as well as the dilutions, plating procedures and scoring of the plates were the same as described for non activation tests.

D. Preparation of Tissue Homogenates and 9,000 x g Cell Fractions

Male animals (sufficient to provide the necessary quantities tissues) were killed by cranial blow, decapitated and bled. Organs were immediately dissected from the animal using aseptic techniques and placed in ice-cold 0.25 M sucrose buffered with Tris at pH of 7.4. Upon collection of the desired quantity of organs, they were washed twice with fresh buffered sucrose and completely homogenized with a motor-driven homogenizing unit at 4°C. The whole organ homogenate obtained from this step was divided into two samples. One sample was frozen at -80°C and the other was centrifuged for 20 minutes at 9,000 x g in a refrigerated centrifuge. The supernatant from the centrifuged sample was retained and frozen at -80°C. These two frozen samples were used for the activation studies.

E. Data Recording and Reporting

Following the specified incubation periods all population plates were scored by an automatic colony counter and the results from each plate of a set were recorded, in ink, on data processing forms. All minimal or other types of selective media plates were hand scored and the results recorded along with the respective population data. Other relevant experimental data were recorded on experimental definition forms. For bacteria strains the number of colonies recorded from either the population or selective plates represents that number in 1 ml of test suspension plated. The numbers recorded for the yeast strain D4 represent the number in 0.5 ml of test suspension plated. Data was then processed and printed from a computer program.

IV. RESULTS SECTION

A. Solubility Properties of the Test Compound

1. Name or code designation of the test compound: 004429429
   Potassium Metabisulfite

2. Test solvent: Saline

3. Solubility of the test compound under treatment conditions:
   Soluble under treatment conditions.

4. Additional comments: White powder

B. Toxicity and Dosage Determinations for the Test Compound

1. Test date for toxicity determination: November 13, 1974

2. The 50% survival level was determined for bacteria and yeast indicator organisms by conducting survival curves with the test compound at the following concentrations:

Percent Concentration (w/v or v/v)
5.0
0.5
0.05
0.005
0.0005

3. Concentrations of the test compound used in the mutagenicity tests:

	Percent Concentration	
Dose	Bacteria	Yeast
1/4 50% Survival	0.005	0.07
1/2 50% Survival	0.010	0.15
50% Survival	0.020	0.30
Plate Tests	0.010	--

IV. SUMMARY OF TEST RESULTS

Plate Tests

A. Name or code designation of the test compound: 004429429

B. Test date: April 23, 1975

C. Concentration of the test compound: 0.01%

Test	Species	Tissue	TA-1535		TA-1537		TA-1538	
			1	2	1	2	1	2
1. Non-activation								
Solvent Control	---	---	138	146	25	22	26	35
Positive Control[a]	---	---	$>10^4$	$>10^4$	193	176	158	219
Test Compound	---	---	169	139	23	10	25	36
2. Activation								
Negative Control	---	---	16	15	27	23	11	14
Solvent Control	---	---	12	9	36	43	17	18
Reaction Mixture Control	---	---	10	18	36	39	9	17
Positive Control[b]	Mouse	Liver	$>10^3$	$>10^3$	146	143	239	225
Positive Control		Lung	9	8	33	33	14	11
Positive Control		Testes	11	7	37	32	15	15
Positive Control	Rat	Liver	$>10^3$	$>10^3$	84	80	329	313
Positive Control		Lung	10	8	32	35	16	12
Positive Control		Testes	11	6	24	43	16	16
Positive Control	Monkey	Liver	$>10^3$	$>10^3$	47	43	122	129
Positive Control		Lung	7	9	32	38	15	10
Positive Control		Testes	9	5	28	33	15	15
Test Compound	Mouse	Liver	8	9	44	34	29	12
Test Compound		Lung	8	4	29	25	12	7
Test Compound		Testes	9	5	39	40	16	22
Test Compound	Rat	Liver	8	9	45	42	18	6
Test Compound		Lung	5	6	32	36	12	10
Test Compound		Testes	6	7	30	34	16	22
Test Compound	Monkey	Liver	9	10	40	36	16	10
Test Compound		Lung	6	2	30	22	7	7
Test Compound		Testes	8	5	27	28	15	21

a TA-1535 EMS 10 µl/plate
TA-1537 QM 20 µg/plate
TA-1538 NF 100 µg/plate

b TA-1535 DMNA 50 µm/plate
TA-1537 AAF 100 µg/plate
TA-1538 AAF 100 µg/plate

DATA TABLE TERMS AND ABBREVIATIONS

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
COMPOUND	Client designated compound number appears in this column.
TEST CODES	NAN = Non Activation: Solvent Control NAP = Non Activation: Positive Control NA1 = Non Activation: Test Compound Dose 1 NA2, etc. = Reflects the other dose level(s) A+C = Negative Chemical Control A-C = Activation: Solvent Control ACP = Activation: Positive Control ACT = Activation: Test Compound A+T = Activation: Tissue Control LI = Liver Tissue Activation Fraction LU = Lung Tissue Activation Fraction KI = Kidney Tissue Activation Fraction TE = Testes Tissue Activation Fraction 1,2, etc. = Dose Levels
CONCENTRATION	All test compound dose levels are expressed as a whole number followed by an exponent (negative) identified by the appropriate units. Example: 0025-2PCT = 0.25 percent concentration
POPU	Total number of viable cells in the plating sample raised to some exponent printed directly below the abbreviation (i.e., EP + 6 = X 10^6).
MUT 1	Total number of mutants or convertants obtained from the sample plated raised to some exponent printed directly below the abbreviation (i.e., EP + 0 = X 10^0). For strain D4, MUT 1 represents the number of ADE+ convertants.
MUT 2	Only used for strain D4 and represents the number of TRY+ convertants in the plated sample.
FREQ 1	The calculated mutation or gene conversion frequency times the negative exponent written directly below. For strain D4, FREQ 1 represents the ADE+ value.
FREQ 2	Only used for strain D4 and represents the TRY+ conversion frequency.
CONTAM	Presence of contamination on any plates.

cDATA TABLE TERMS AND ABBREVIATIONS (continued)

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
AAF	2-Acetylaminofluorene
DMSO	Dimethylsulfoxide
DMN	Dimethylnitrosamine
EMS	Ethyl Methanesulfonate
QM	Quinacrine Mustard
NF	Nitrofluorene
SPECIES	Animal Strains
SPRDAW	Sprague Dawley Rats
ICRFLO	Flow ICR Random Bred Mice
RHESUS	Rhesus Monkey (Macaca mulatta)
MIXEDB	Dog, Mixed Breed
NEWZEA	New Zealand White Rabbit

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/25/75

SPECIES COMPOUND 004429429

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
NAN		1.22	4.28	9.79	4.37	4.76
NAP		1088.21	415.68	181.23	160.96	60.50
NA1		2.38	6.82	13.93	2.99	5.41
NA2		1.10	7.33	13.64	4.12	5.40

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/25/75

SPECIES ICRFLO COMPOUND 004429429

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A+C	2.63	3.70	4.95	3.56	4.07
ACT	A-C	1.05	3.44	2.56	3.82	6.21
ACT	PLI	58.39	14.57	36.50	7.31	9.96
ACT	PLU	1.15	3.31	4.31	3.71	3.84
ACT	PTE	9.55	3.74	3.35	3.06	6.12
ACT	LI1	0.62	3.82	1.85	13.80	3.98
ACT	LI2	1.25	4.60	2.92	4.44	5.37
ACT	LU1	2.29	1.18	1.48	8.75	4.42
ACT	LU2	3.31	2.58	3.00	5.29	6.90
ACT	TE1	5.07	3.63	2.38	4.76	5.09
ACT	TE2	1.05	3.39	2.67	4.29	8.70

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/25/75

SPECIES SPRDAW COMPOUND 004429429

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A+C	3.12	10.83	10.78	2.69	2.22
ACT	A-C	4.26	8.33	5.64	4.67	3.00
ACT	PLI	49.05	18.14	129.82	6.49	4.25
ACT	PLU	2.70	5.39	15.38	4.51	4.26
ACT	PTE	3.52	12.52	6.04	2.91	4.07
ACT	LI1	3.17	9.08	7.53	3.22	4.92
ACT	LI2	2.48	5.63	2.52	4.20	5.85
ACT	LU1	2.50	4.54	3.14	4.91	5.68
ACT	LU2	3.28	5.76	1.58	3.47	4.67
ACT	TE1	1.84	6.14	2.07	3.26	3.58
ACT	TE2	2.19	5.38	4.63	3.85	4.64

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 04/25/75

SPECIES RHESUS COMPOUND 004429429

TEST	ORG	TA1535 HIS EX-8	TA1537 HIS EX-8	TA1538 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
ACT	A+C	5.36	5.04	15.13	5.59	4.93
ACT	A-C	8.28	3.26	4.81	5.31	6.15
ACT	PLI	197.63	14.44	49.46	5.89	6.26
ACT	PLU	15.17	2.95	4.60	3.75	5.23
ACT	PTE	5.03	5.26	5.69	4.84	3.49
ACT	LI1	5.00	4.35	7.14	3.96	1.68
ACT	LI2	3.52	1.87	3.59	5.00	1.35
ACT	LU1	2.15	3.37	4.41	4.18	3.47
ACT	LU2	9.09	2.58	1.37	5.76	6.11
ACT	TE1	4.45	6.85	2.49	4.80	4.80
ACT	TE2	3.35	3.06	4.76	4.90	6.32

V. INTERPRETATION OF RESULTS AND CONCLUSIONS

Compound 004429429, Potassium Metabisulfite, was tested for mutagenic activity using a series of microbial indicator organisms in qualitative plate tests with and without metabolic activation. The following results were obtained:

A. Salmonella typhimurium

1. Plate tests

At a concentration of 0.01%, 004429429 was not mutagenic for the bacterial indicator organisms employed in either direct or activation plate tests.

2. Nonactivation suspension tests

The results of these tests were negative.

3. Activation suspension tests

The results of these tests were negative.

B. Saccharomyces cerevisiae

1. Nonactivation suspension tests

The results of these tests were negative.

2. Activation suspension tests

The results of these tests were negative. One dose (MOUSE LIl with D4) exhibited a slight increase at the ADE lows, but it was not considered significant.

C. Conclusions

Compound 004429429, did not exhibit genetic activity in any of the in vitro tests employed in this evaluation.

Submitted by:

David Brusick, Ph.D.
Director of Genetics

APPENDIX

Tabulation of Data

Litton BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 431701 DETECTOR TA1535 SPECIES DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0576	0007	1.22	2
	NAP		EMS 0.002 %	0390	4244	1088.21	0
004429429	NA1		0001-2 PCT.	0505	0012	2.38	0
004429429	NA2		0005-3 PCT.	0635	0007	1.10	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 431702 DETECTOR TA1537 SPECIES DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0817	0035	4.28	0
	NAP		QM 1.0 UG/ML	0236	0981	415.68	0
004429429	NA1		0001-2 PCT.	0777	0053	6.82	0
004429429	NA2		0005-3 PCT.	0846	0062	7.33	0

Litton BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 431703 DETECTOR TA1538 SPECIES DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		DMSO	0337	0033	9.79	0
	NAP		NF 125 UG-ML	0341	0618	181.23	0
004429429	NA1		0001-2 PCT.	0201	0028	13.93	0
004429429	NA2		0005-3 PCT.	0286	0039	13.64	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 433801 DETECTOR 0000D4 SPECIES DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	NAN		SALINE	1303	0057	0062	4.37	4.76	0
	NAP		EMS 1.0 %	0643	1035	0389	160.96	60.50	0
004429429	NA1		0015-2 PCT.	1072	0032	0058	2.99	5.41	2
004429429	NA2		.0007-2 PCT.	1092	0045	0059	4.12	5.40	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 432301 DETECTOR TA1535 SPECIES ICRFLO DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0799	0021	2.63	0
	A-C		SALINE	0667	0007	1.05	0
	ACP	LI	DMN 50 UM/ML	0793	0463	58.39	0
	ACP	LU	DMN 50 UM/ML	0695	0008	1.15	2
	ACP	TE	DMN 50 UM/ML	0555	0053	9.55	2
004429429	ACT	LI1	0001-2 PCT.	1129	0007	0.62	2
004429429	ACT	LI2	0005-3 PCT.	0802	0010	1.25	2
004429429	ACT	LU1	0001-2 PCT.	0525	0012	2.29	2
004429429	ACT	LU2	0005-3 PCT.	0513	0017	3.31	0
004429429	ACT	TE1	0001-2 PCT.	0513	0026	5.07	2
004429429	ACT	TE2	0005-3 PCT.	0764	0008	1.05	2

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 432401 DETECTOR TA1537 SPECIES ICRFLO DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	1677	0062	3.70	0
	A-C		DMSO	1365	0047	3.44	0
	ACP	LI	AAF 800 UG/ML	1119	0163	14.57	0
	ACP	LU	AAF 800 UG/ML	1180	0039	3.31	2
	ACP	TE	AAF 800 UG/ML	1417	0053	3.74	2
004429429	ACT	LI1	0001-2 PCT.	1231	0047	3.82	2
004429429	ACT	LI2	0005-3 PCT.	1305	0060	4.60	2
004429429	ACT	LU1	0001-2 PCT.	1694	0020	1.18	2
004429429	ACT	LU2	0005-3 PCT.	1471	0038	2.58	2
004429429	ACT	TE1	0001-2 PCT.	1378	0050	3.63	2
004429429	ACT	TE2	0005-3 PCT.	1710	0058	3.39	2

Litton BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 432501 DETECTOR TA1538 SPECIES ICRFLO DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0646	0032	4.95	0
	A-C		DMSO	0742	0019	2.56	0
	ACP	LI	AAF 800 UG/ML	0737	0269	36.50	2
	ACP	LU	AAF 800 UG/ML	0510	0022	4.31	0
	ACP	TE	AAF 800 UG/ML	0717	0024	3.35	2
004429429	ACT	LI1	0001-2 PCT.	1134	0021	1.85	2
004429429	ACT	LI2	0005-3 PCT.	0958	0028	2.92	2
004429429	ACT	LU1	0001-2 PCT.	0473	0007	1.48	2
004429429	ACT	LU2	0005-3 PCT.	0533	0016	3.00	2
004429429	ACT	TE1	0001-2 PCT.	0797	0019	2.38	2
004429429	ACT	TE2	0005-3 PCT.	0712	0019	2.67	2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 433701 DETECTOR 000004 SPECIES ICRFLO DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0787	0028	0032	3.56	4.07	6
	A-C		SALINE	0837	0032	0052	3.82	6.21	0
	ACP	LI	DMN 90 UM/ML	0793	0058	0079	7.31	9.96	0
	ACP	LU	DMN 90 UM/ML	0781	0029	0030	3.71	3.84	0
	ACP	TE	DMN 90 UM/ML	0556	0017	0034	3.06	6.12	6
004429429	ACT	LI1	0015-2 PCT.	0855	0118	0034	13.80	3.98	2
004429429	ACT	LI2	0007-2 PCT.	0856	0038	0046	4.44	5.37	0
004429429	ACT	LU1	0015-2 PCT.	1063	0093	0047	8.75	4.42	6
004429429	ACT	LU2	0007-2 PCT.	0870	0046	0060	5.29	6.90	0
004429429	ACT	TE1	0015-2 PCT.	0924	0044	0047	4.76	5.09	4
004429429	ACT	TE2	0007-2 PCT.	0793	0034	0069	4.29	8.70	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 431801 DETECTOR TA1535 SPECIES SPRDAW DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0513	0016	3.12	0
	A-C		SALINE	0470	0020	4.26	0
	ACP	LI	DMN 50 UM/ML	0422	0207	49.05	0
	ACP	LU	DMN 50 UM/ML	0370	0010	2.70	0
	ACP	TE	DMN 50 UM/ML	0227	0008	3.52	0
004429429	ACT	LI1	0001-2 PCT.	0252	0008	3.17	2
004429429	ACT	LI2	0005-3 PCT.	0323	0008	2.48	0
004429429	ACT	LU1	0001-2 PCT.	0200	0005	2.50	0
004429429	ACT	LU2	0005-3 PCT.	0274	0009	3.28	0
004429429	ACT	TE1	0001-2 PCT.	0217	0004	1.84	0
004429429	ACT	TE2	0005-3 PCT.	0228	0005	2.19	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 431901 DETECTOR TA1537 SPECIES SPRDAW DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0600	0065	10.83	0
	A-C		DMSO	0840	0070	8.33	0
	ACP	LI	AAF 800 UG/ML	0998	0181	18.14	0
	ACP	LU	AAF 800 UG/ML	1169	0063	5.39	0
	ACP	TE	AAF 800 UG/ML	0735	0092	12.52	0
004429429	ACT	LI1	0001-2 PCT.	0771	0070	9.08	0
004429429	ACT	LI2	0005-3 PCT.	1331	0075	5.63	0
004429429	ACT	LU1	0001-2 PCT.	0859	0039	4.54	0
004429429	ACT	LU2	0005-3 PCT.	0920	0053	5.76	0
004429429	ACT	TE1	0001-2 PCT.	1026	0063	6.14	0
004429429	ACT	TE2	0005-3 PCT.	1059	0057	5.38	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 432201 DETECTOR TA1538 SPECIES SPRDAW DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0371	0040	10.78	0
	A-C		DMSO	0443	0025	5.64	0
	ACP	LI	AAF 800 UG/ML	0228	0296	129.82	0
	ACP	LU	AAF 800 UG/ML	0312	0048	15.38	0
	ACP	TE	AAF 800 UG/ML	0298	0018	6.04	0
004429429	ACT	LI1	0001-2 PCT.	0186	0014	7.53	0
004429429	ACT	LI2	0005-3 PCT.	0238	0006	2.52	2
004429429	ACT	LU1	0001-2 PCT.	0159	0005	3.14	0
004429429	ACT	LU2	0005-3 PCT.	0190	0003	1.58	0
004429429	ACT	TE1	0001-2 PCT.	0241	0005	2.07	0
004429429	ACT	TE2	0005-3 PCT.	0216	0010	4.63	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 434301 DETECTOR 0000D4 SPECIES SPRDAW DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0854	0023	0019	2.69	2.22	0
	A-C		SALINE	1135	0053	0034	4.67	3.00	0
	ACP	LI	DMN 90 UM/ML	0848	0055	0036	6.49	4.25	0
	ACP	LU	DMN 90 UM/ML	0821	0037	0035	4.51	4.26	0
	ACP	TE	DMN 90 UM/ML	0860	0025	0035	2.91	4.07	0
004429429	ACT	LI1	0015-2 PCT.	1057	0034	0052	3.22	4.92	0
004429429	ACT	LI2	0007-2 PCT.	1025	0043	0060	4.20	5.85	4
004429429	ACT	LU1	0015-2 PCT.	1038	0051	0059	4.91	5.68	4
004429429	ACT	LU2	0007-2 PCT.	0836	0029	0039	3.47	4.67	4
004429429	ACT	TE1	0015-2 PCT.	1256	0041	0045	3.26	3.58	7
004429429	ACT	TE2	0007-2 PCT.	1012	0039	0047	3.85	4.64	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 432604 DETECTOR TA1535 SPECIES RHESUS DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0392	0021	5.36	0
	A-C		SALINE	0338	0028	8.28	0
	ACP	LI	DMN 50 UM/ML	0337	0666	197.63	0
	ACP	LU	DMN 50 UM/ML	0211	0032	15.17	0
	ACP	TE	DMN 50 UM/ML	0298	0015	5.03	0
004429429	ACT	LI1	0001-2 PCT.	0300	0015	5.00	0
004429429	ACT	LI2	0005-3 PCT.	0398	0014	3.52	0
004429429	ACT	LU1	0001-2 PCT.	0418	0009	2.15	0
004429429	ACT	LU2	0005-3 PCT.	0319	0029	9.09	0
004429429	ACT	TE1	0001-2 PCT.	0247	0011	4.45	0
004429429	ACT	TE2	0005-3 PCT.	0358	0012	3.35	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 433101 DETECTOR TA1537 SPECIES RHESUS DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0794	0040	5.04	0
	A-C		DMSO	1135	0037	3.26	0
	ACP	LI	AAF 800 UG/ML	1122	0162	14.44	0
	ACP	LU	AAF 800 UG/ML	0848	0025	2.95	0
	ACP	TE	AAF 800 UG/ML	0874	0046	5.26	0
004429429	ACT	LI1	0001-2 PCT.	0781	0034	4.35	0
004429429	ACT	LI2	0005-3 PCT.	0961	0018	1.87	0
004429429	ACT	LU1	0001-2 PCT.	0891	0030	3.37	0
004429429	ACT	LU2	0005-3 PCT.	1047	0027	2.58	0
004429429	ACT	TE1	0001-2 PCT.	0686	0047	6.85	0
004429429	ACT	TE2	0005-3 PCT.	1178	0036	3.06	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 433601 DETECTOR TA1538 SPECIES RHESUS DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0152	0023	15.13	0
	A-C		DMSO	0187	0009	4.81	0
	ACP	LI	AAF 800 UG/ML	0279	0138	49.46	0
	ACP	LU	AAF 800 UG/ML	0261	0012	4.60	1
	ACP	TE	AAF 800 UG/ML	0246	0014	5.69	0
004429429	ACT	LI1	0001-2 PCT.	0154	0011	7.14	0
004429429	ACT	LI2	0005-3 PCT.	0306	0011	3.59	0
004429429	ACT	LU1	0001-2 PCT.	0136	0006	4.41	0
004429429	ACT	LU2	0005-3 PCT.	0365	0005	1.37	0
004429429	ACT	TE1	0001-2 PCT.	0241	0006	2.49	0
004429429	ACT	TE2	0005-3 PCT.	0189	0009	4.76	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 434401 DETECTOR 000004 SPECIES RHESUS DATE - 04/25/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0912	0051	0045	5.59	4.93	4
	A-C		SALINE	0960	0051	0059	5.31	6.15	4
	ACP	LI	DMN 90 UM/ML	0815	0048	0051	5.89	6.26	4
	ACP	LU	DMN 90 UM/ML	0879	0033	0046	3.75	5.23	4
	ACP	TE	DMN 90 UM/ML	0888	0043	0031	4.84	3.49	4
004429429	ACT	LI1	0015-2 PCT.	1010	0040	0017	3.96	1.68	6
004429429	ACT	LI2	0007-2 PCT.	0960	0048	0013	5.00	1.35	6
004429429	ACT	LU1	0015-2 PCT.	0981	0041	0034	4.18	3.47	6
004429429	ACT	LU2	0007-2 PCT.	0868	0050	0053	5.76	6.11	0
004429429	ACT	TE1	0015-2 PCT.	1001	0048	0048	4.80	4.80	0
004429429	ACT	TE2	0007-2 PCT.	0918	0045	0058	4.90	6.32	0